excellence, consists well with the warmer elements of a broader humanity. A citation or two may be in place. "Pure logic, and pure mathematics (which is the same thing), aims at being true, in Leibnizian phraseology, in all possible worlds, not only in this higgledy-piggledy job-lot of a world in which chance has imprisoned us." Again: "It is a disgrace to the human race that it has chosen to employ the same word 'is' in two such utterances as, Socrates is human, and Socrates is a man." Once more: "Men may be defined as featherless bipeds, or as rational animals, or (more correctly) by the traits by which Swift delineates the Yahoos."

<div align="right">CASSIUS J. KEYSER.</div>

COLUMBIA UNIVERSITY.

Elements of Vector Algebra. By L. SILBERSTEIN. London, Longmans, 1919. 8vo. 4 + 42 pp. Price $1.60.

Extract from the Preface—"This little book was written at the instance of Messrs. Adam Hilger, and, in accordance with their desire, it contains just what is required for the purpose of reading and handling my *Simplified Method of Tracing Rays, etc.* (Longmans, Green and Co., London, 1918). With this practical aim in view, all critical subleties have been purposely avoided. In fact, it is scarcely more than a synoptical presentation of the elements of vector algebra covering the needs of those engaged in geometrical optics. At the same time, however, it is hoped that this booklet will serve a more general purpose, viz., to provide everybody unacquainted with the subject with an easy introduction to the use of vector algebra.

"It is scarcely necessary to explain that the deductions given in this book are based on Euclid's axioms, notably with the inclusion of his postulate of parallels—upon which the equality of vectors is most essentially based. Those readers who are desirous of seeing how the formal rules here given can be generalized so as to be valid independently of the axioms of congruence and of parallels, may consult the author's *Projective Vector Algebra* (Bell and Sons, 1919), and a sequel to it published in *Phil. Mag.* for July, 1919, pp. 115–143. It is, however, advisable for the student to become first thoroughly familiar with the Euclidean vector algebra as here presented."

Contents—Section 1. Vectors defined, 1–2; 2. Equality of vectors defined, 2–3; 3. Addition of vectors, 3–10; 4. Subtraction of vectors, 10–11; 5. Scalar product of two vectors, 11–17; 6. The vector product of vectors, 17–21; 7. Expansion of vector formulæ, 21–23; 8. Iteration of vectorial multiplication 23–25; 9. The linear vector operator, 25–38; 10. Hints on differentiation of vectors, 38–40; Index, 41–42.

<div align="center">NOTES.</div>

The Elementary Differential Geometry of Plane Curves by R. H. FOWLER, fellow of Trinity College, Cambridge is the latest issue, number 20, of the Cambridge Mathematical Tracts (Cambridge University Press, price 6 shillings).

The beautiful large pages, large type, and wide margins which the *American Journal of Mathematics* maintained for forty-one years have made way for pages about one-half as large, smaller type, and narrower margins.

Among the rich contents of *Archivio di Storia della Scienza,* volume 1, no. 2, June, 1919 (published February, 1920) are: an unpublished letter by Pierre Fermat, edited by G. Giovannozzi, 137–140; a bibliography of the printed works and of the facsimilies of manuscripts of Leonardo da Vinci, by A. Mieli, 177–187; a methodical bibliography of works on the history of science (326 titles) published in Italy since 1913, by A. Mieli, 195–217; and a review by G. Loria of L. C.

Karpinski's *Robert of Chester's Latin Translation of the Algebra of al Khowarismi* (New York, 1915) 218–219.

Heft 12, in December, 1919, completed the jubilee volume of *Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht aller Schulgattungen,* founded by J. C. V. Hoffmann (1825–1905) in 1869.

In 1911 Teubner published the first two volumes of the great edition of Leonard Euler's *Opera Omnia*, now being prepared under the auspices of the Swiss Mathematical Society, a section of the Society of Swiss Naturalists. It was planned that the works should contain about 70 volumes and be issued in three series: series I—opera mathematica, 28 volumes; series II—opera mechanica et astronomica, 27 volumes; series III—opera physica, miscellanea, epistolae, 15 volumes.

Thirteen of these volumes have been published: the two volumes of *Dioptrica* in series III; the two volumes of *Mechanica sive motus scientia analytice exposita* in series II; and the following nine volumes in series I—*Vollständige Anleitung zur Algebra;* the first of four volumes of *Commentationes arithmeticae;* the four volumes of *Institutiones calculi differentialis* and *Institutiones calculi integralis;* the first of the two volumes of *Commentationes analyticae* (integrals); and the two volumes of *Commentationes analyticae* (elliptic integrals).

In E. C. Moore's *What the War Teaches About Education and other Papers and Addresses* (New York, Macmillan, 1919) Chapter 6, pages 95–119, entitled "Does the study of mathematics train the mind specifically or universally?", was an address before the Association of Teachers of Mathematics in New England, April, 1917; chapter 7, pages 120–128, entitled "Mathematics and formal discipline again," was reprinted from *School and Society*, December 29, 1917, and is a reply to "The inadequacy of arguments against disciplinary values" by C. N. Moore; chapter 8, pages 129–151, entitled "Does the study of mathematics train the mind specifically or universally? A reply to a reply," is reprinted from *School and Society*, April 27, 1918, in reply to "Does the study of mathematics train the mind specifically or universally? A reply" by R. E. Moritz.

ARTICLES IN CURRENT PERIODICALS.

ANNAES SCIENTIFICAS DA ACADEMIA POLYTECHNICA DO PORTO, volume 13, 1919, no. 2: "Pedro Nunes e os infinitamente pequenos" by R. Guimaraes, 65–71—No. 3: "Sur les surfaces réglées" by C. Servais, 129–151; "Sur l'octaèdre à faces triangulaires" by J. Neuberg, 161–171.

BULLETIN DE LA SOCIÉTÉ MATHÉMATIQUE DE FRANCE, volume 47, nos. 1–2, 1919: "Les fondements de la théorie des fonctions elliptiques" by H. Hancock, 37–42.

BULLETIN DES SCIENCES MATHÉMATIQUES, volume 54, August, 1919: Review by H. Deltheil of G. Castelnuovo's *Calcolo delle Probabilità* (Milano-Roma-Napoli, 1919), 165–174; Review by E. Cartan of G. Bouligand's *Cours de géométrie analytique* (Paris, 1919), 175–178; "Sur les intégrales de Fresnel" by A. Bloch, 179–180.

HARVARD GRADUATES MAGAZINE, volume 28, March 1920: "An American liaison officer in Paris" by J. L. Coolidge, 394–408.

MATHEMATICAL GAZETTE, volume 9, no. 143, December, 1919: "Report of the Mathematical Association committee on the teaching of mathematics in public and secondary schools,"